



BCT Workshop

June 23 -25

Long-Term Operation & Monitoring Optimization

presented

by

Todd Lanning,

AFBCA

Introduction

- ◆ LTO Optimization
- ◆ LTM Optimization

Castle Airport Pump & Treat

Operable Unit 2, GAC



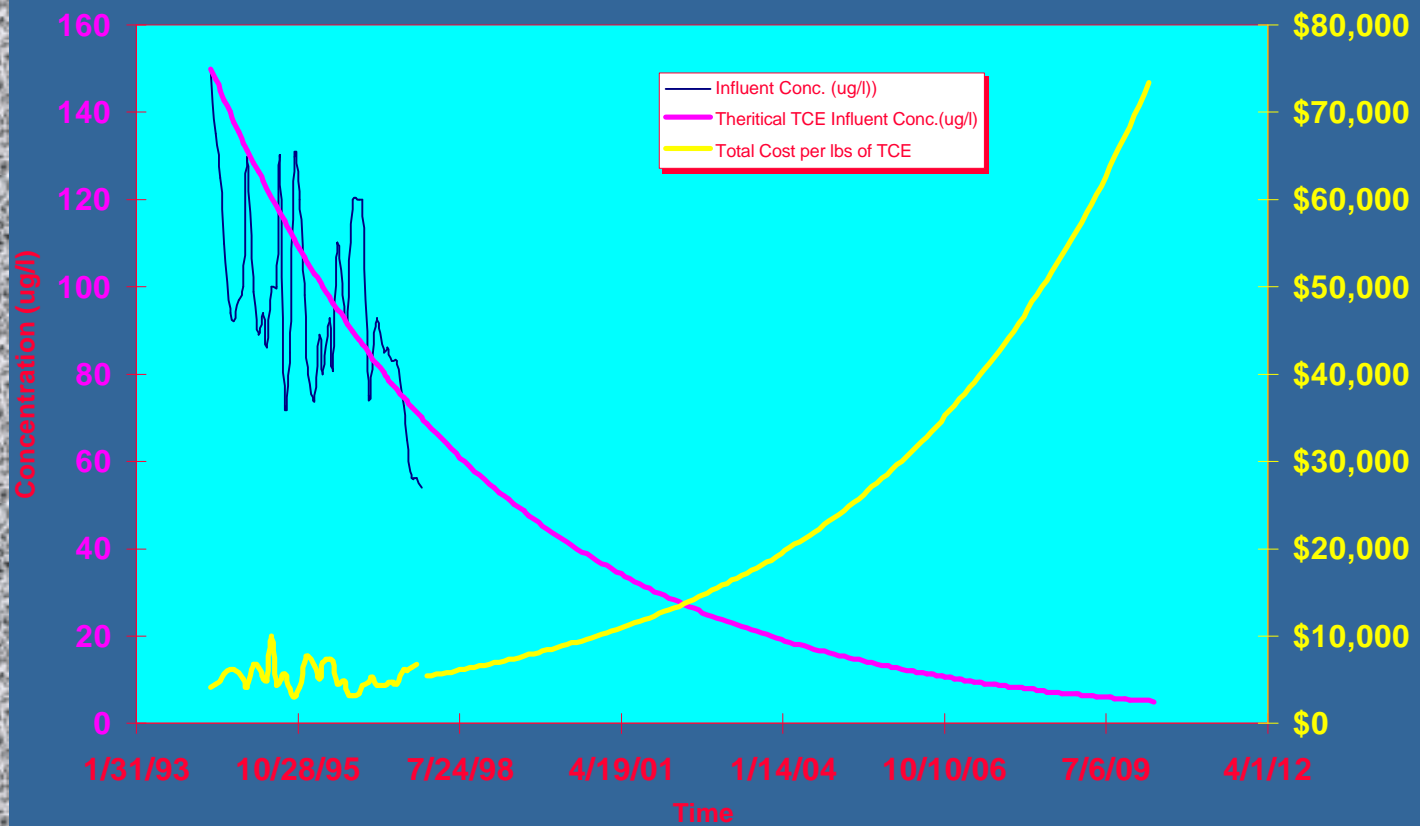
Operable
Unit One,
Air Stripping



Contaminant Removal Costs

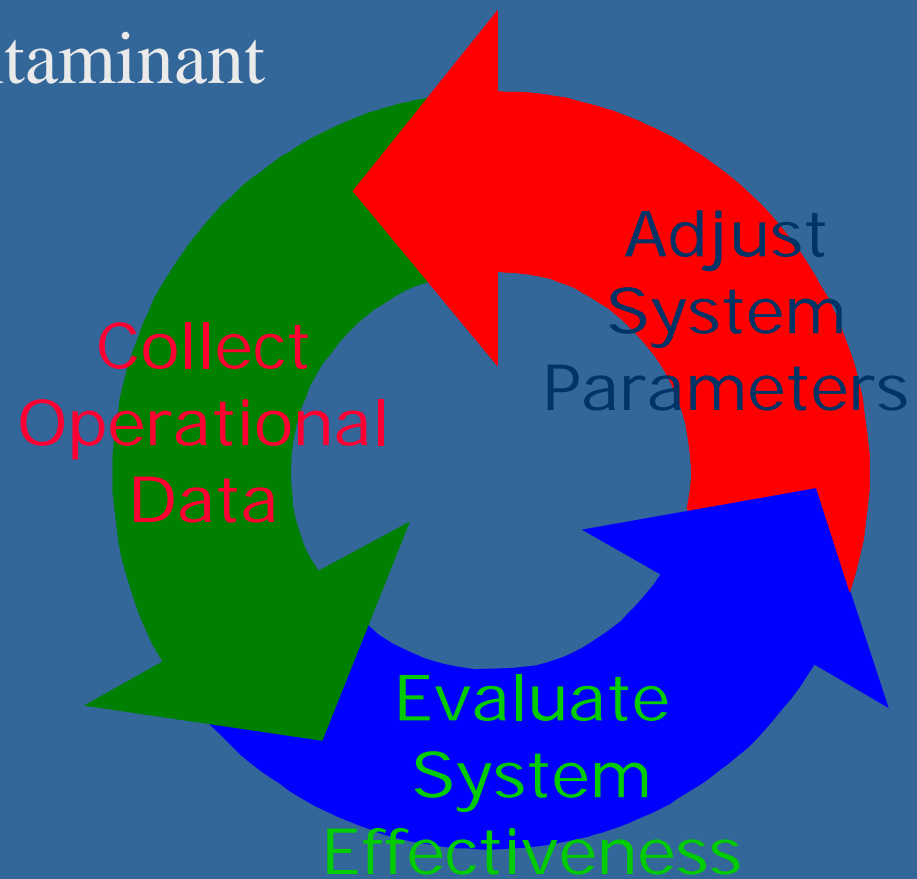
OU-1

Actual & Modeled TCE Conc. with Associated Removal Costs



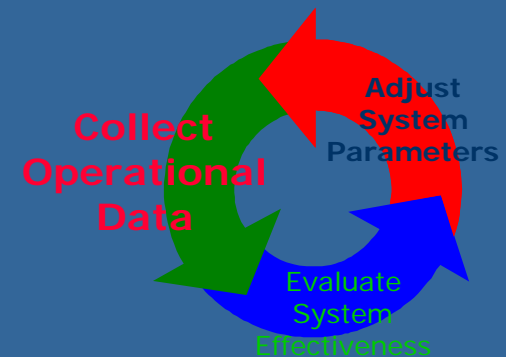
LTO Plant Optimization

- ◆ Maximize Contaminant Removal



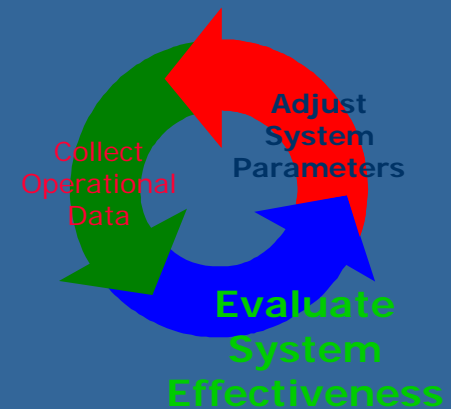
Operational Data

- ◆ Data Quality Objectives
- ◆ Hydraulic Data
- ◆ Chemical Data



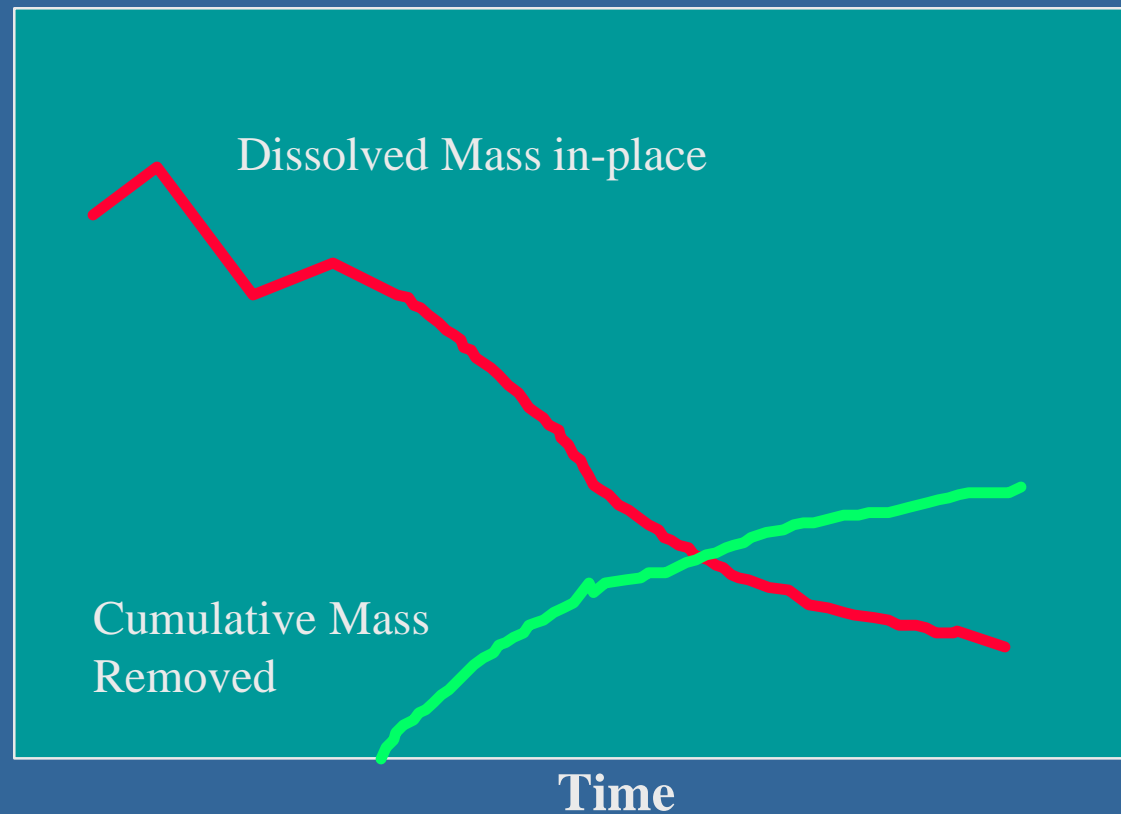
System Effectiveness

- ◆ Groundwater Flow Management
 - Pore Volumes
 - Evaluate Well Effectiveness



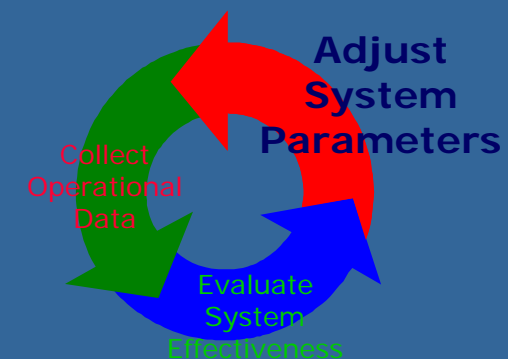
Mass Removal Trends

Mass of
VOC

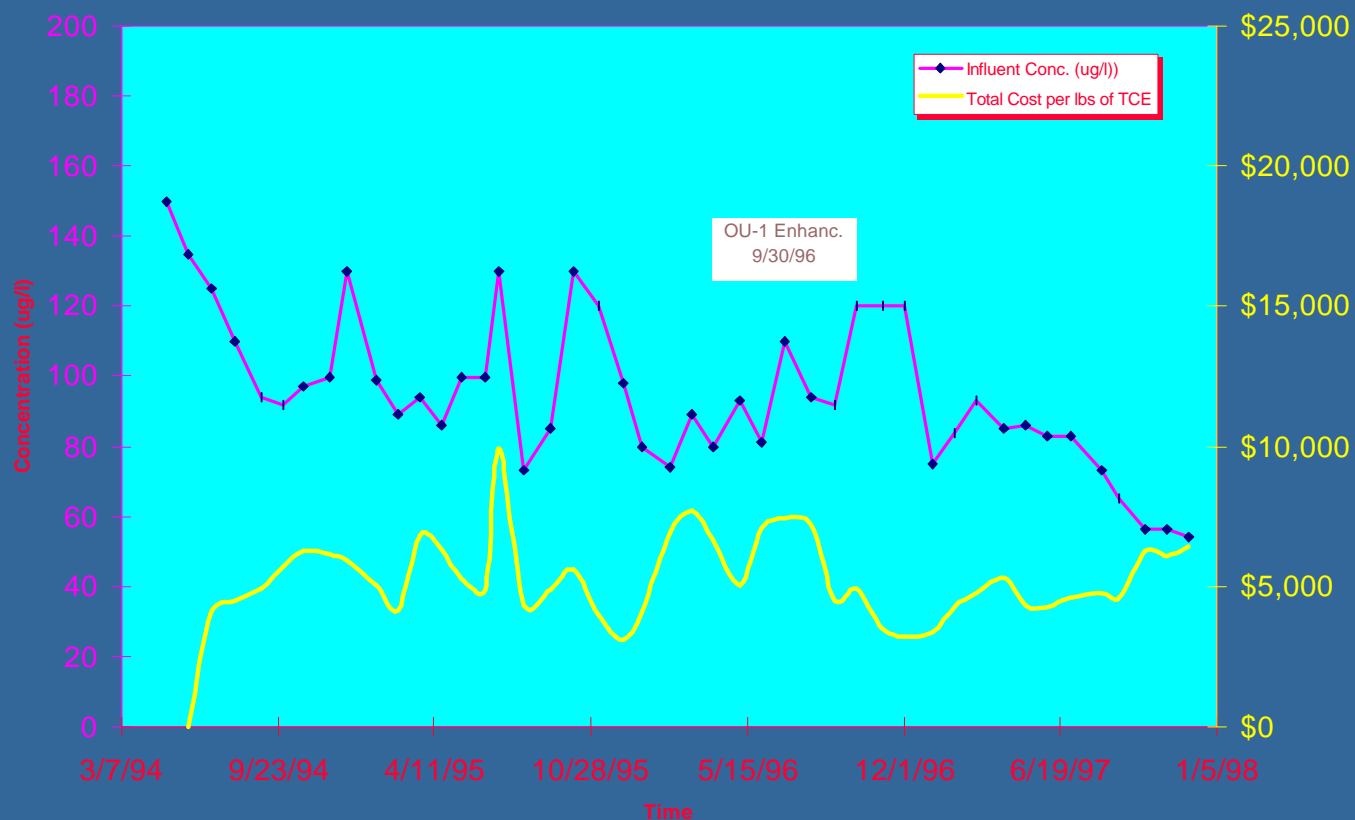


Adjust System Parameters

- ◆ Maximize Contaminant Removal
- ◆ Adaptive Pumping Schemes
- ◆ Pulse Pumping
- ◆ Modify System



System Enhancements



Treatment Plants

- ◆ Minimize Down Time
 - Good Design & Construction
 - Reliable Controls
 - Simple Design
 - Proper Maintenance

LTM Optimization

◆ *Long-Term Monitoring Optimization Guide*
Air Force Center for Environmental Excellence, Final Version 1.1
Oct 1997

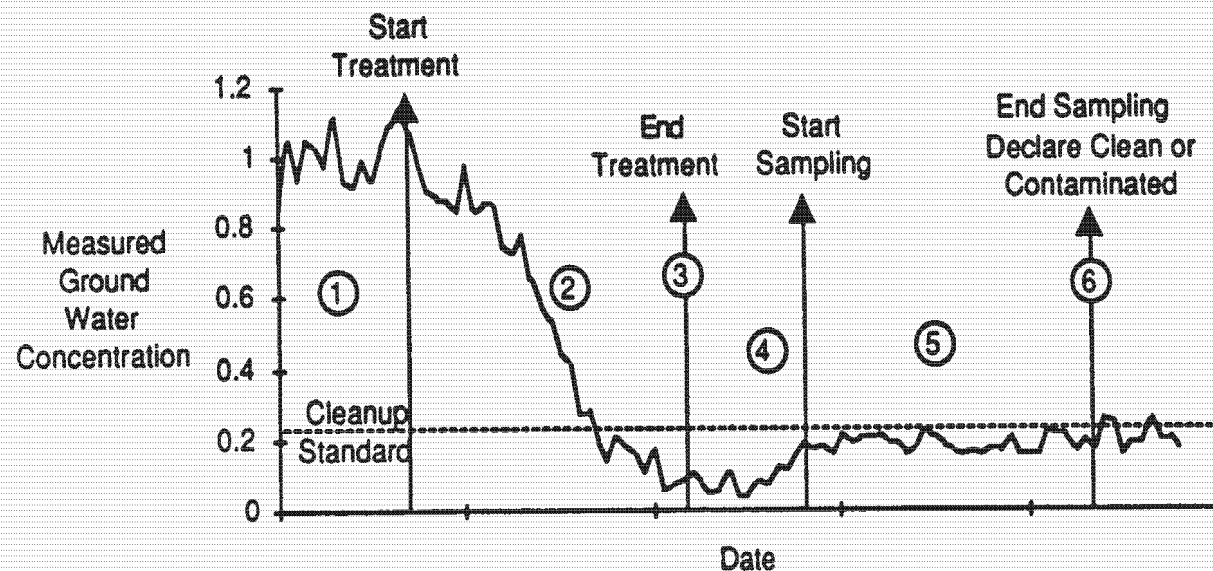
<http://www.afcee.brooks.af.mil>

Objective

- ◆ Assure compliance with data quality objective and quality assurance requirements to improve overall effectiveness while minimizing cost

Decision Rules & DQOs

- ◆ Decision Rules
- ◆ Data Quality Objectives



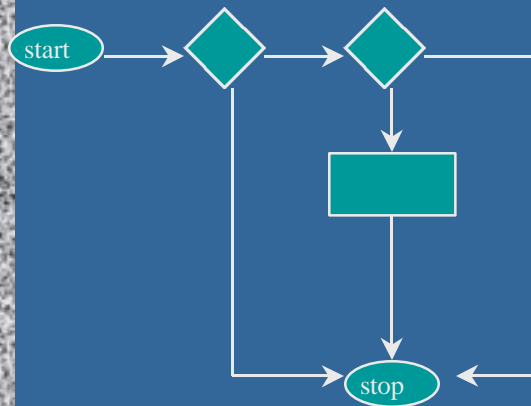
source: EPA/230-R-92-014



Reduce the Number of Wells Sampled

- ◆ Eliminate Spatially Correlated Sampling Points
- ◆ Eliminate Wells that don't fill DQO's
- ◆ Eliminate Wells in poor physical Condition or Screened Over Multiple Aquifers

Optimize Sampling Frequency



- ◆ Frequency based on DQO's Established by Monitoring Program
- ◆ Frequency Based on Spacial Relationship to the Plume



Select Efficient and Cost-Effective Field Procedures

- ◆ Well Development
- ◆ Low-Flow Purging
- ◆ Purge Water Disposal
- ◆ Well Placement
- ◆ Well Abandonment

Analytical Protocols

- ◆ Analysis Based on COCs
- ◆ Indicator Analysis
- ◆ Analytical Suites
- ◆ Analysis of Quality Assurance
- ◆ Competitive Laboratory Bids



Streamlining Data Management Requirements

- ◆ Collection and Format
- ◆ Data Evaluation
- ◆ Data Storage



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Video 1

Video 2

Video 3

Video 4